1. A method for controlling access to an optical network, comprising:

reserving time slots available within a frame via a control channel;

allocating the reserved times slots into a number of cycles, wherein a number of time slots in each cycle equals to a predetermined number of wavelengths;

stacking a composite packet having multiple wavelengths;

transmitting the composite packets onto the network;

receiving composite packets from the network; and

unstacking the received composite packets.

2. The method according to claim 1, further including stacking the composite packets such that the composite packets have the predetermined number of wavelengths.

3. The method according to claim 1, further including reserving time slots in a current reservation cycle to transmit the composite packets to a selected destination where the selected destination is not reserved in the current reservation cycle.

4. The method according to claim 3, wherein a node makes a reservation only if it has a composite packet to send and unused credits for some destination.

5. The method according to claim 1, further including stacking the composite packet in a cycle adjacent a cycle in which a time slot was reserved.

6. The method according to claim 1, further including transmitting the composite packet two cycles after the cycle in which the time slot was reserved.

7. The method according to claim 1, further including receiving the composite packet two cycles after its reservation has been observed, and buffering a received packet.

8. The method according to claim 7, further including unstacking the buffered packet in a cycle adjacent a cycle in which the packet was received.

9. The method according to claim 1, further including bandwidth reservation using credits.

10. The method according to claim 9, further including renewing credits once per frame of a negotiated length.

11. The method according to claim 10, further including ending a frame when each queue is empty and/or out of credits.

12. A method of controlling access to an optical network comprising:

reserving wavelengths available within a next time slot of a frame via a control channel;

transmitting a packet onto the network by using a tunable laser and a coupler; and

receiving a packet by tuning a tunable receiver to its wavelength.

13. The method according to claim 12, further including bandwidth reservation using credits.

14. The method according to claim 13, further including renewing credits once per frame of a negotiated length.

15. The method according to claim 14, further including ending a frame when each of a plurality of credit queues is empty and/or out of credits.

16. The method according to claim 12, wherein a node makes a reservation only if it has packets to send and unused credits for some destination, and the destination is not already reserved.

17. A method for controlling admission of new bandwidth reservation in an WDM optical ring network, comprising:

receiving a bandwidth request for a node source-destination pair;

determining whether there is sufficient network capacity for the bandwidth request;

updating the number of credits per frame to be assigned to input-output pairs whenever the bandwidth is requested and/or previously assigned bandwidth is released;

renewing credits by loading queue counters to specified numbers at the beginning of each frame; and

reserving time slots available within a frame via a control channel if the queue counters are positive, and decrementing the corresponding queue counter whenever the reservation is made.

18. The method according to claim 17, further including assigning $a_{ij} > 0$ time slots to node source-destination pair (i, j), $1 \le i, j \le N$, within a frame of length $\le F_{max}$, if the conditions expressed as $W \cdot \left(\sum_{l} a_{il} + \sum_{k} a_{kj} \right) + \sum_{\substack{k,l \\ k \to i \to l}} a_{kl} \le F_{\max} \cdot$ are satisfied, where W represents the number of wavelengths in the composite packet, k, l, $k \to i \to l$ are nodes such that node k transmits packets to node l over node i, and a_{il}, a_{kj}, and a_{kl} represent respective time slots assigned to the node source-destination pair.

19. The method according to claim 18, further including determining whether there is sufficient network capacity for bandwidth request Δa_{ij}, by determining whether conditions $W\cdot(s'_k + D'_k) + l'_k \le F_{max}, 1 \le k \le N$ are satisfied,

where:

$$a'_{ij} = a_{ij} + \Delta a_{ij}, \quad s'_i = s_i + \Delta a_{ij}, \quad d'_j = d_i + \Delta a_{ij},$$
$$a'_{kl} = a_{kl}, \quad s'_k = s_k, \quad d'_l = d_l, \quad 1 \le k, l \le N, k \ne i, l \ne j,$$

$$l'_k = \begin{cases} l_k + \Delta a_{ij} & : \quad i \to k \to j \\ l_k & : \quad \text{otherwise} \end{cases}$$

$$D'_k = \begin{cases} \max(D_k, d'_j) & : \quad a'_{kj} > 0 \\ D_k & : \quad \text{otherwise} \end{cases}.$$

20. An optical network, comprising:

an admission controller for determining whether the network has capacity to accept a new bandwidth request; and

an add/drop node for transmitting and receiving composite packets having multiple wavelengths stacked in time.

21. The network according to claim 20, wherein the add/drop node further includes a wavelength stacking assembly for stacking multiple wavelengths into a composite transmit packet.

22. The network according to claim 20, wherein the add/drop node further includes an optical switch coupled to the network and a buffered transmit switch for storing packets until transmitted.

23. The network according to claim 20, wherein the add/drop node further includes a buffered receive switch for storing packets until received.

24. The network according to claim 20, wherein the add/drop node further includes a wavelength unstacking assembly for unstacking multiple wavelengths from a composite transmit packet.

25. The network according to claim 20, wherein the admission controller assigns a number of credits within a frame corresponding to accepted bandwidth requests.

26. The method according to claim 20, wherein the add/drop node further reserves time slots in a current reservation cycle to transmit to a selected destination where the selected destination is not reserved in the current reservation cycle and a transmitter has unused credits for the selected destination.